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Sorption properties of pyrolysis products in carbon-containing wastes after “dry” ashing

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Abstract

© TJPRC Pvt. Ltd. In this paper, they studied the properties of potential sorption materials obtained by pyrolysis method from sludge, sawdust, crushed waste of used tires and chicken manure and treated with "dry" ashing. They studied the moisture content and bulk density of solid products from carbon-containing waste pyrolysis. The parameters of water extract and the content of heavy metals were determined. They studied the adsorption capacity of pyrolysis products by blue methylene on UNICO 2800 spectrophotometer and iodine by titrimetric method. They studied the sorption properties of pyrolysis products from carbon-containing wastes after ashing with respect to iron, copper, chromium, nickel and zinc ions under static conditions using atomic-emission spectrometry with inductively coupled plasma on Agilent 720-OES spectrometer. The degree of sorption to heavy metal ions was calculated. For comparison, the data on commercial coal sorbent BAU and the sorption degree of solid pyrolysis products without treatment have been established. It was established that after the processing waste wood and rubber by "dry" ashing for pyrolysis products, the sorption capacity with respect to iron, copper and chromium ions increases. The degree of purification from ITM: Fe, Cu, Cr using solid products of carbon-containing waste pyrolysis after the treatment by ashing: for sludge-52.7-99.6%, for wood waste-88-99.5%, for rubber waste-36, 1-99.5%, and chicken manure-45.--95.7%. The best sorption capacity with respect to iron, copper and chromium ions and in comparison with BAU coal was shown by the product of wood waste pyrolysis after the treatment with "dry" ashing. Such a processing allows to increase the sorption capacity of SPP from wood waste by Fe ions in 8.9 times, Cu-2.6 times, Cr-1.4 times.

Keywords

Adsorption, Carbon-containing waste, Pyrolysis, Waste & heavy metals ions

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